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Visual Perception in Pre-School Children

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VISUAL PERCEPTION IN PRE-SCHOOL CHILDREN

by

Howard Mark Bardwell

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H. Mark Bardwell

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ABSTRACT

Visual Perception in Pre-School Children

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This study was undertaken to determine if sessions in discrimination tasks with the aid of instructional cues would influence the visual perceptual abilities of pre-school children. The research was conducted in the Child Development Laboratories at Utah State University. Twenty children were used--ten in the experimental group and ten in the control group. The ten children in the experimental group were given training in performing tasks that required ability in visual perception. The ten children in the control group received no such training.

It was found that the ten children who received the individualized instruction scored significantly higher on post-test visual discrimination tasks than did the ten children who received no training. The children who received the training made a significant increase in their perceptive ability. This was indicated by a comparison of beginning test scores with ending test scores.

There was no significant difference in the visual perception abilities of boys and girls or older and younger children as measured in the visual discriminations tasks.

(54 pages)

INTRODUCTION

Much of what children learn is through some form of perception. One of the facets of perception is visual perception. In recent years there has been much concern about the pre-school child's environment and his ability to learn. How do children of a pre-school age learn? Do they perceive the same things that adults perceive, when looking at the same objects?

> . . . Some psychologists have maintained that the ability to perceive is as much a part of man's genetic endowment as the ability to breathe; others have contended that perception is an acquired capacity, wholly dependent on experience and learning. The nativists have argued that a baby sees about what adults see; enpiricists have held that an infant's visual world must be--in William Jame's words--"buzzing confusion." (Bower, 1966, p. 80)

What a child "sees" when he looks at an object may or may not be the same as what an adult sees when he looks at the same object. The retinal thing is in all probability the same--provided that they are the same distance from the object--though they may "see" something quite differently. The controversy of how a child perceives has not been resolved at this point. The evidence points to the fact that the human's ability to perceive visually is an extremely complex system.

The distance of an object from the viewer does not effect the viewer's perception of the object size if he is familiar with the object, yet the size and location of the retinal image is changed. How does a person learn this

accommodation? It is developed to the point in most humans where a conscious effort is not necessary to perceive the size of the object.

As adult human beings, we are able to perceive an object from an abstract drawing of that object. By abstract it is not meant to mean "modern art", but a picture of the object that in reality has very few of the same qualities of the original. A black line drawing of an object represents the object, but often has none of the same qualities, with the exception of shape. The object in reality may be highly colored, with three dimensional qualities.

The problem

Discrimination skills seem to be learned skills, a product of experience. The problem to be investigated in this study has been to explore the influence of a planned series of experiences in perception and discrimination on young children, from three to five years of age. Specifically, the problem has been to investigate the degree to which three to five year old children could be taught to recognize a color picture of an object, and then transfer this ability to a black line drawing of that same object.

Objectives

The objective of this study has been to determine whether a series of training experiences in visual perception, using pictorial representations which closely resemble actual objects, and which include a variety of cues,

contribute to children's ability to transfer their learned skills to more abstract representations of the same objects.

Hypotheses

The following hypotheses were made:

A sequence of experience in visual perception will contribute to children's ability to transfer their learned skills to more abstract representations of the same objects.

There will be no significant difference between boys and girls in their response to training in visual perception.

There will be no significant difference between three and four year old children in their response to training in visual perception.

REVIEW OF THE LITERATURE

Bower (1966) feels that infants and children are able to register most of the information perceived visually that adults can register; but they are able only to handle part of the information that adults can. "Through maturation they presumably develop the requisite information-processing capacity." (Bower, 1966, p. 92)

Weintraub and Walker (1966) states that "The manner in which we perceive is plastic. It is subject to modification through learning and can vary with circumstances . . . ." (Weintraub and Walker, 1966, p. 74) Traditional theorists of perception tend to view how we perceive in a relatively isolated manner from the rest of our environment, and experience. According to Weintraub and Walker (1966), many newer theorists tend to view perception in relation to motivational and learning variables. Many variables must be taken into account to determine an observer's readiness to perceive something in one manner rather than another.

> . . . An observer is presumed to categorize stimulus input from his environment by the process of reaching decisions among possible alternative categories. Such a decision is determined not only by the stimulus input but also by what the observer is prepared to perceive. (Weintraub and Walker, 1966, p. 9)

If we are to assume that Weintraub's and Walker's (1966) theories are correct we could expect that all children would not be able to perform the task in this study. Though the children were from relatively the same social class, and

background, their environments may have been quite different. This being true, what they perceive would also be different. The ability to categorize a full color picture and relate it to a black-line drawing may exist in some, and not in others.

Beadle (1970) supports Weintraub and Walker (1966) in the theory that what is perceived is more than what is there.

> . . . It has become increasingly apparent in more recent years that the internal condition of the perceiver exercises tremendous influence upon what is perceived. This can mean a physiological state; a maturational factor such as nearsightedness of children, a condition that diminishes gradually over their first few years of life; or a transient state common to everyone, such as hunger. (Beadle, 1970, p. 26)

What is perceived by children, or adults for that matter, is not necessarily what one individual is perceiving. What we perceive is determined by more than our physiological state, maturational age, or state of well being.

> . . . . We can thus anticipate that culturally conditioned expectations might contribute to a perceptual end product in ways in which the perceiver is unaware, with the result being a culturally influenced difference in perception of similarity. (Segal, Campbell and Herskovits, 1966, p. 26)

What is familiar to one child, or group of children, because of his social, personal, religious, or family background would be perceived differently by another child of a different background. There are cultural idiosyncracies that are common to the area of this country, as well as gross understandings that are common to individual countries.

What a child learns, his frame of reference, and how he related what he is seeing is decided by his past ecperiences to a great extent. The reason that past experiences effect what is perceived is that a child relates what he sees to these past experiences.

Heilman (1967) points out the fact that visual perception is very important in beginning reading. If a child cannot distinguish the letter forms, and the words from the white page, it will be impossible for him to get any meaning from the printed word.

Do young children take in, or register, the same cues that adults do? Children may use different cues than adults do, or they may use cues that adults have used so long, that they are no longer conscious of using these cues. These cues may be so ingrained that they are similar to a person's ability to perceive the size of an object though the retinal image is changed by distance. We simply are not aware of our physiological adaptive mechanisms that take care of this size discrimination for us.

Bly (1970) found that pre-school training is very important to children, and increases their ability to learn various things that are required when the children enter a formal school setting. One of the things required in a formal school setting is reading. If a pre-school child is trained in perception, the ability to discriminate the letter form and word from the printed page may be easier when a child gets into a beginning reading situation.

Bly (1970, p. 25) points out that, "The earlier the training, the better the progress in formal schooling."

> Maturation cannot be hastened, but visual discrimination can be sharpened through experience and practice. The school must provide as much of this experience as is needed, and different children will need different amounts . . . . (Heilman, 1967, p. 45)

Though maturation cannot be hastened, it does seem that pre-school experience in a quality program is helpful to children in learning to perceive. If the experience in a pre-school setting is wide and varied, when a child is maturally ready for a particular learning task, his environment should contain an opportunity for him to learn that task.

There are many things that can cause children to have visual perception problems. Among these are nearsightedness, astigmatism, and Heilman (1967) states that the most common is farsightedness. If a child is having perception problems, it would be worth it to have the child's physiological abilities checked for malfunction.

In Piagetian theory, the infant first begins to make sense out of his world by constructing meanings from the things with which he makes contact. First, he probably makes gross discriminations between sensory patterns that capture his attention. Then traces of memory begin to emerge, perhaps a sense of "same" and "different". If two or more sensory patterns are presented closely together, the child might begin to remember them together. If this bond of association is not broken up, eventually the child will learn to expect one sensory pattern when the other appears, thus giving some meaning to the first one presented.

> The process of recognizing or interpreting any sensory experience at hand, using the memory or previously associated experiences, is perception.
>
> Although the process of perception is apparently a simple mental process, it is basic to all learning. It mediates the meaning of all incomeing sensory data in terms of the individual's past experiences, thus assuring that the new meanings he acquires will be integrated into the whole of his store of knowledge, his cognitive structure (or Piaget's "schemata").
>
> The more abundant the child's sensory experiences and past associations, the richer his perceptions and the greater his learning will be . . . . (Heilman, 1967, pp. 165-166)

At the Institute for Developmental Studies, one of the main assumptions is that a child's development depends on the quality of the interaction he has with the world around him, particularly in the early years of life (Deutsch, 1958).

Not only is wide and varied experience important at an early age, but the quality of experience is of utmost importance. A child will receive contact with his environment, even though it may be a limited one. The child who receives experience that is designed to build on past experience, and yet allows the child to categorize and pattern in a way that is comfortable for him will learn faster, and in a more concrete manner than one who receives an array of unrelated experiences that are incongruent with his past experiences.

> If there is no perception, there is no basis for anything more than memorization or recall. So it is important to take the time to orient children, to give them opportunities to "feel their way" into what they are about to learn. (Smith, 1967, p. 64)

Through perception we learn. Visual perception is only one aspect of perception, but it enhances all other areas, and they in turn enhance what is perceived visually. A child sees a bird, but to hear it sing gives further

sensory impact. One form of perception without the others is limited, but for analysis and study they must be separated into individual categories.

Cheves (1967) feels that children have many things that can cause problems of perception. One of these, which supports Heilman (1967) in his theory, is the "difficulty of perceiving figure and background," which if not correct can cause problems later when a child begins to read, or should begin to read.

Another problem that Cheves (1967) points out is the problem of distractability. By this she means that the child wanders and looks at every detail of a task, rather than concentrating on the task as a whole. It is difficult for a child to concentrate on a particular task for any length of time. It seems that the younger that a child is, the less time he will be able to concentrate.

Perseveration is another problem that exists to hinder children from continued perception. A child will master a task, and feel confident in this task, it is something that a child can do well, and feel successful at doing. This limits a child because he will hesitate, or be unable to shift to a new and more difficult task. Perseveration may be from fear of failure, or lack of self confidence. The fact that perseveration occurs emphasizes the importance of considering the whole child and his whole environment when looking at a perception task, or problem.

Goins (1958) feels that perceiving the symbols from the printed page and transmission of impulses to the brain for interpretation are the processes that take place in visual perception.

Before a child can perceive something from the printed page, he must be able to distinguish it, and maturationally he must be able to interpret, categorize, or handle the information that is before him on that page.

METHODS AND PROCEDURES

Setting

There are three Child Development Laboratories operated by the Department of Family and Child Development at Utah State University. These laboratories are located in the Family Life Building on the Utah State University Campus. The purpose of these laboratories are to facilitate greater growth intellectually, physically, socially and emotionally in the children enrolled, as well as to provide an opportunity for college students to develop skills, insights, and understanding through observing and working with the children. It is the desire of the staff to give the child experiences that are not only enjoyable, but challenging and interesting. Many varied experiences are worked into the child's laboratory environemnt to expand and enlighten his reportoir of past experiences.

Each of the three laboratories has two groups of children meeting four days per week, Monday through Thursday. Each Friday is used for planning the next week's activities, removing toys from the shelves and replacing them with new toys selected on the basis of goals and plans, for the following week.

The three laboratories: North, West, and East, share a central kitchen, library, and three storage closets. The storage closets contain extra toys, colored paper, educational games, manipulative toys, cars and

trucks, puzzles, science equipment, and doll house equipment. These three laboratories also share a large, enclosed playground area outside the building. This area has many excellent permanent pieces of equipment which include a circular slide, a tree house, a swinging gate, parallel bars, a sandbox and rope ladders to climb. There are also many pieces of equipment that are used which are stored in a garage that is adjacent to the playground. These pieces can be moved rapidly, and are varied from week to week.

Each laboratory has an accompanying observation booth through which students, interested parents, and others can view the children. Each booth has one way glass so the children cannot see into the booth, and louvred screening so that conversations in the classroom can be heard by those in the observation booth. There are small tables, chairs, toilets, and sinks suited for a child's use in each classroom. There are movable shelves and screens for display of manipulative toys and dividing the room into various activity areas. Activity areas in the room include a personal locker for each child to put his extra personal clothing, and provide a place of his own for him to have while at school. Each room has a block area where many sizes and shapes of blocks are provided for the children to use in a creative manner while developing large muscles. Each room has a manipulative area where the children can pursue intellectual activities, and develop small muscle coordination. There is in each room a doll house area, with child-sized appliances, tables, and chairs. Here children can role play, imitate their mother or father, and pursue dress up activities. There is a quiet area

in each room, where there is a rug, books, records, and a record player. This area is used for storytelling, group activities on the floor and quiet play by the children. There is also in each room a jungle gym for large muscle development.

The children used in this study would be a good representation of the children enrolled in the Child Development Laboratory. They would not, however, be a true representation of Cache Valley, nor of Logan, itself. The parents of these children seem to be concerned and interested in their children's education. This is emphasized by the fact that many children in the laboratory had their names placed on the laboratory waiting list soon after their birth. A child's name is placed on the waiting list and remains there until he gets old enough for the laboratory, and his name is far enough up on the list for him to be accepted. Names of children who are not accepted are removed from the list after they become old enough to enter kindergarten.

Another purpose of the laboratory is to train student teachers. Students majoring in Child Development and other students who are interested in Early Childhood Education can enroll in a program through the College of Family Life and after some preparation become student teachers in the Child Development laboratory. During their time as student teachers, they learn many valuable techniques such as: room arrangement, proper selection of toys to fit the week's activities that are planned in advance, and how to direct the activities of 20 children as well as do an extensive study on one child in the group.

There are four student teachers in a laboratory at one time. During the course of a quarter at the University, each of these student teachers is responsible for planning two or more weeks around a central theme. At this time, this student acts as the head teacher with the other student teachers, and the supervisor, acting as assistants, to aid and lend their support in carrying out the week's activities. The goals and objectives listed on each week's lesson plans are designed to reinforce the main concepts, or over-all goals for the week. Each day is different, and various activities support the main goal. One day in the laboratory may have a science experiment, and a visitor, while the next day may include an excursion, and an exciting food experience.

Sample

The children used in this study were selected at random from the 80 children in the four pre-school groups in the East and West laboratories. When the pre-test was given, it was found that three of the 20 chosen for this study were able to complete the pre-test without error. This made it necessary to exclude these three from the study and go back to the table of random.

The laboratory groups are made up of an equal number of boys and girls. The control and experimental groups were made up of equal numbers of boys and girls also. A problem arose when one boy in the control group moved to California the day before he was scheduled to be given the post-test.

Had the experimenter been aware of this, he could have administered the post-test a day earlier. The experimenter dropped a boy from the experimental group as well, to keep the number participating the same. So in the final analysis, there is one more girl in each group than boys.

Instrument

The Teaching Resource section of the New York Times developed some visual-motor perception teaching materials for use in kindergarten and the primary grades. One section, the section of fruit and animal puzzles, was used for this study. There are seven sets of pictures in this section, and six levels of complexity for each set of picture puzzles. There are four sets of animal puzzles, and three sets of fruit puzzles. The three sets of fruit puzzles and three sets of the animal puzzles were used in this study.

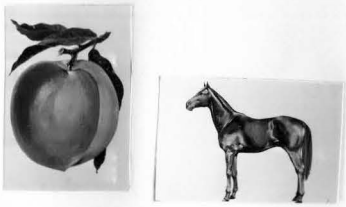
> Each of the seven picture puzzles depicts only one element, either an animal or a fruit. The pictures are realistic in drawing and color. There is a black border on each of the first three levels and the last level in each set of puzzles. This aids the child in attending to the task by limiting his visual field and to serve as a clue in putting the puzzles together. On the last level the fruit or animal is a black outline. (Cheves, 1967, p. 4)

The fruit pictures are on a rectangular piece of poster board, and are properly oriented when the poster board is in a vertical position. The animal pictures are placed on the poster board in a position so that they are viewed correctly when the poster board is in a horizontal position (see Figure 1).

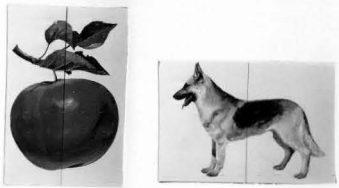
Each picture puzzle depicted only one thing. A dog, horse, cat, apple, peach or orange. Each piece of puzzle depicted one element of the object: a

stem, leaf, or large portion of the fruit; an eye, leg, or tail of the animal picture. There was a black border on each of the first four levels of the puzzle sequence. This aids the children in limiting their visual field, and helping them concentrate on the subject at hand. No border surrounded the picture at the fifth level. Each level of the drawing is realistic in color, and well done. The last level (Level VI) was a black-line drawing of the particular object (fruit or animal) on a white poster board, with a black outline.

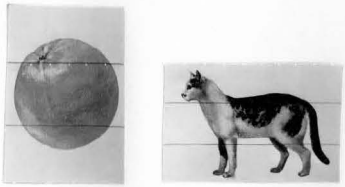
The experimenter developed a method of recording each child's performance on the pre-test and the post-test. Level VI of each picture was used for the pre-test and the post-test. This level is a black outlined drawing of the picture it is to represent. Level VI is cut into three pieces horizontally (see Figure 1). Six different pictures were used, with three puzzle pieces for each picture. This gave a total of 18 possible correct responses on the test. One point was given for each puzzle piece the child placed in the correct position. Each correct response was recorded (Figure 2) for each individual child, on the sheet. The child's name, age and sex was recorded on the sheet developed by the experimenter. This same sheet (Figure 2) was used by the experimenter to record each child's individual progress in the experimental group.



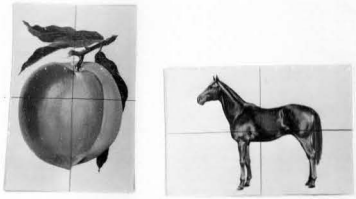
Level I. uncut picture



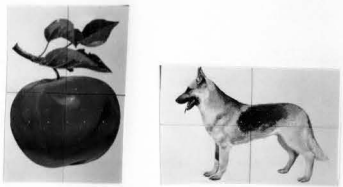
Level II. puzzle cuts



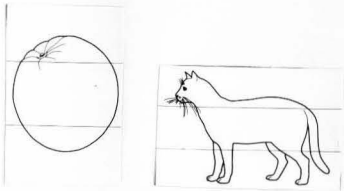
Level III. puzzle cuts



Level IV. puzzle cuts



Level V. puzzle cuts



Level VI. puzzle cuts

Figure 1. Drawing of picture puzzles used in this experiment.

Methodology

Pilot study. Five children were selected at random from the Child Development Laboratories at Utah State University for use in the pilot study. The children in the pilot study were taken through the pre-test, the instructional material, and then the post-test. The children used in the pilot study were not used in the main study. The pilot study was to familiarize the experimenter with the procedures, and to find if the proposed procedures were workable. A companion study found that the children using this instrument often tipped the pictures on their sides, or even upside down, while still putting the pieces of each picture puzzle in a proper relation to each other.

This experimenter used a piece of masking tape on the table in the room where the child and the experimenter went to work on this study. This masking tape was placed on the table, directly in front of the child's seat. This was running across horizontally so that it formed a baseline for the pictures. This gave the child a visual focus point on which to place the bottom of the picture. The experimenter placed the first level of the picture on this tape, using it as a baseline, and told the child that this was the bottom, pointing to the tape and helping the child to understand that this was the bottom.

It was found that the tape seemed to help, and the children did not tip the pictures excessively as they had in the companion study.

Name_____ Age_____ Sex_____ Group_____

	LEVEL II	LEVEL III	LEVEL IV	LEVEL V	LEVEL VI Pre-test	LEVEL VI Post-test	Orientation	DATE	TOTALS Right	TOTALS Wrong	COMMENTS
Peach											
APPLE											
ORANGE											
DOG											
HORSE											
CAT											
TOTALS Right											
TOTALS Wrong											
DATE											

Figure 2. Score sheet used in administering this instrument.

Collection of data

The children selected for use in this study were asked to leave the Child Development Laboratory individually and go into a separate room with the experimenter. The separate room used was the library. Many of the children were familiar with the experimenter, and were not reluctant to go with him into the room. The children were asked to go into this room during their free play time in the Child Development Laboratory. This was so arranged to eliminate as much as possible, any interference with the planned activities of the program. The experimenter went into the pre-school and asked each child individually to accompany him to the testing room.

When the child and the experimenter arrived at the separate room, there was a table with two chairs for them to sit while working on the picture puzzles. To help put the children at ease, especially those not familiar with the experimenter, the children were asked to perform a simple color matching task. Each child was asked to match a colored disk with the same color on a board. The three primary colors were used. The child's performance on this task was in no way recorded, and it turned out that all the children were able to complete the task satisfactorily. This activity gave the child a successful experience, and provided the child and the experimenter with a chance to vocalize and become comfortable with one another. The child was praised for his performance, and put at ease in this situation.

After the color matching exercise each child was given the pre-test individually and asked to put the pieces of the puzzle together. There

were no cues given, and when each child indicated that he was finished, he received praise and thanks from the experimenter. The results were recorded and the experimenter took the child back to the classroom. At this time the child was thanked for his cooperation, and asked if he would come and help the experimenter again at a later time. All of the children were very cooperative.

The pre-test consisted of Level VI of the test instrument. Level VI is a black-line drawing of the fruit or animal on a white poster board with a black outline. It is cut into three pieces horizontally. The results were recorded on the same sheet used for recording the post-test (Figure 2).

Twenty children were selected from the Child Development Laboratory at random. Each child who was available was assigned a number. A table of random numbers was used to select the children from the group of 40. A pencil was dropped on the table of random numbers, point down, and beginning at that point the experimenter worked downward to the bottom of that column and then went to the next column left to select the 20 children for this study.

Of the 20 children selected for this study, three were able to complete the pre-test without error. This necessitated using the table of random numbers to select three more children. The experimenter continued down the column from the last child's number selected to pick the three additional children needed.

When 20 children were found who could not successfully complete the pre-test they were divided into two groups—odd numbers into one group, even numbers into another group. One group of ten was to be used as the experimental group, and the other group of ten was to be used as the control group. Group No. 1, or the group with odd numbers, was selected as the deciding group. A toss of the coin decided this. Heads it would be experimental and tails it would be control. The other group would then be the opposite. As it turned out, Group No. 1 was selected as the experimental group. After this distinction was made, the experimental group was approached individually again, and asked to help the experimenter once more.

When the experimenter and the child were seated in the separate room for instructional time, the child was presented with the uncut picture of the set (Level I). This uncut picture is part of the set, but is not an achievement level. In the first session, the children were instructed only on the fruit pictures, this consisted of three sets and five levels.

The following procedures were employed in administering the instructional material:

Set one (peach)

1. The uncut picture (Level I) of the peach was placed right side up in front of the child, on the table. The bottom of the picture was placed near the child, on the masking tape.

   a. The experimenter said, "Here is a picture of a peach."

b. "Notice the black border on the picture." Experimenter points to the border to show the child.

c. "Notice the leaves on the peach." Experimenter points to the leaves at the top of the peach.

d. "This is the bottom of the picture." Experimenter points to the bottom of the picture and the tape.

2. The uncut picture of the peach (Level I) was then moved to the right of the child, where he could still see it, but where it was no longer directly in front of him. The child was then given the two pieces of the picture puzzle cut vertically (Level II) face up. The pieces were one on top of the other, and as the tests were administered, it was watched so that the pieces were placed in an unorganized manner on top of each other. This was so that the child would be unable to use patterning of how the pictures were handed to him as cues for putting the pieces together.

a. "Here is another picture of a peach, but it has been cut into two pieces."

b. "Will you please put the two pieces of this picture together so that they make a picture that looks like this picture." The experimenter then points to the uncut picture (Level I) of the peach on the child's right.

c. "Notice the black border on the picture." The experimenter points to the black border on the uncut picture.

d. "Notice the leaves at the top of the peach." The experimenter points to the leaves on the peach at the right.

e. "Remember where the bottom of the picture goes." The experimenter points to the tape on the table in front of the child.

3. When the child is able to complete Level II he is presented with the picture that has a black border and is cut horizontally into three pieces (Level III).

a. "Here is another picture of a peach, this picture has been cut into three pieces. Will you please put the pieces together so that they make a picture like this one?" The experimenter then points to the uncut picture at the child's right.

b. "Notice the border around the picture." The experimenter points to the border on the uncut picture at the child's right.

c. "Notice the leaves on the peach." The experimenter points to the leaves on the picture at the child's right.

d. "Remember where the bottom of the picture goes." The experimenter points to the tape to show the child where the bottom should go.

4. When the child could complete successfully the picture cut into three pieces horizontally (Level III) he was presented with the pieces of the picture cut into fourths. One cut vertical and the other horizontally (Level IV).
    a. The same cues were given to the child as were given in the preceeding levels of the puzzle.
5. When the child was able to properly complete the picture puzzle cut into fourths, with a black border (Level IV), the original picture (Level I) was removed. The child was then presented with a picture of the same peach, cut into fourths, without the black border (Level V).
    a. The same cues were given with this picture puzzle, with exception of the cue about the black border.

Set two (apple)

1. The same procedure was used with the apple as was used with the peach.

Set three (orange)

1. The same procedure was used with the orange as was used with the apple and the peach, with the exception of the leaves. The stem on the orange was pointed out instead of leaves.

The child was then returned to the Child Development Laboratory. The experimenter felt that to go through all six sets at one time would be an extremely long session for the child. After the ten children in the experimental

group had been through the first three levels of the fruit picture puzzle, the experimenter went back to the first child and the same process was executed with the animal puzzles. There was, however, one extra cue with the animal picture puzzles. The black border, the head, the tail, and the bottom of the picture were pointed out to the child with the animal pictures.

After a time lapse of approximately two weeks from the time a child took the pre-test, the same child was then brought back into the separate room by the experimenter and given the post-test. The post-test was administered in the same manner as the pre-test, and no cues were given. The child was asked to put the three pieces of the puzzle together. When the child indicated that he was finished, he was praised by the experimenter, told that he had been very helpful and returned to the pre-school classroom.

Each child's progress was recorded on the record sheet (see Figure 2) in the appropriate column for each test. A sum of the correct responses for each child was also recorded on this sheet. Pre-test and post-test scores were recorded on the same sheet for each individual child.

FINDINGS

Analysis of data

The hypothesis that a sequence of experiences in visual perception will contribute to children's ability to transfer their learned skills to more abstract representations of the same objects was supported. The children in the experimental group, who had participated in the training experience, made a greater increase in their perception abilities than was true of the control group of children, who received no training. The difference between the pre-test and post-test scores of children in the experimental group was significant beyond the .01 level of significance. The difference between the pre-test and post-test scores of children in the control group was not significant (Table 1). The mean score of the children in the experimental group on the pre-test was 11.6, which increased to a mean score of 16.1 on the post-test.

One problem existed with the instrument used in this study, which limited the results, or placed a ceiling on the advancements made by children in the experimental group. A complete measure of the child's ability to perform on the test was not achieved, because the total possible number of correct responses was 18, and five of the nine children in the experimental group reached this ceiling on the post-test.

All of the children in the experimental group increased their score on the post-test, as a result of the training provided in the study. This was not ture of all children in the control group.

Table 1. Pre-test and post-test mean scores for children in the experimental and control groups

	Pre-test Mean	Post-test Mean
Control Group	10.4	13.0
Experimental Group	11.6	16.1

The mean rate of increase for the experimental group was 4.5 points. One thing that must be remembered is that there was one child in the experimental group with an extremely low pre-test score. This would appear as a greater increase in the experimental groups' over-all performance. Without that one extreme increase, the mean increase for the experimental group was 3.5

The mean score for the children in the control group on the pre-test was 10.4 this was increased to a mean score of 13.0 on the post-test.

None of the children in the control group reached the ceiling of 18 possible points on the post-test. The mean increase of the children in the control group from the pre-test to the post-test was 2.6. One thing of

significance to remember is that two of the nine children in the control group did not make any increase from the pre-test to the post-test. And, one of the children actually had a score on the post-test that was lower than his score on the pre-test.

The hypothesis that there would be no significant difference between boys and girls in their performance on this test was supported. Though the girls had a greater increase, there was not a significant difference in their scores from the scores of the boys.

One girl had an extremely low score on the pre-test, and made a significant increase for her, individually. This skewed the statistics to show more increase than was common for the other children. This would make it appear that the girls gained more than the boys.

The hypothesis that there would be no significant difference between the younger children and the older children was supported. The performance of younger and older children on both tests did not seem to be effected by the age of the child in either the experimental or the control group. The youngest child in the whole study, a child in the experimental group, made the greatest increase from pre-test to post-test score. This skewed the mean increase statistics.

Any consideration of the findings of this study must include recognition of the fact that the size of the sample was small. All findings must be regarded as being tentative, at best, because of the small number of children in the study.

Table 2. Pre-test and post-test scores of children in the experimental and control groups, by sex

Name	Sex	Pre-test Score	Post-test Score	Difference
Experimental Group				
James	M	15	18	3
Daniel	M	12	13	1
Michael	M	16	18	2
Stephen	M	15	18	3
Laurie Ann	F	3	15	12
Kate	F	7	18	11
Angie	F	10	11	3
Carmelle	F	15	18	3
Kandice Lee	F	12	16	4
Sum of Exp. Group		105	145	
Control Group				
Anna Lee	F	9	15	6
Jacqueline	F	9	13	4
Fiona	F	13	16	3
Shelly	F	16	8	- 8
Tonja	F	10	13	3
Eric	M	8	8	0
Mickey	M	6	16	10
Douglas	M	7	12	5
Kevin	M	16	16	0
Sums of Control Group		94	117	

Table 3. Pre-test and post-test scores of children in the experimental and control groups, by age

Name	Age	Pre-testScore	Post-test Score	Difference
Experimental Group				
Laurie Ann	3-2	3	15	12
Carmelle	3-3	15	18	3
Daniel	3-3	12	13	1
Kandace Lee	3-6	12	16	4
James	3-6	15	18	3
Angie	3-7	10	11	1
Kate	3-9	7	18	11
Michael	4-3	16	18	2
Stephen	4-8	15	18	3
Subjects 9 Sums of experimental group		105	145	
Control Group				
Anna Lee	3-8	9	15	6
Mickey	3-8	6	16	10
Eric	3-10	8	8	0
Fiona	3-10	13	16	3
Shelly	3-11	16	8	- 8
Douglas	4-2	7	12	5
Tonja	4-2	10	13	3
Jacqueline	4-6	9	13	4
Kevin	4-8	16	16	0
Subjects 9 Sums of control group		94	117	

SUMMARY AND CONCLUSIONS

Summary

Visual perception has been shown to be an important factor in the lives of children. It is important not only for the child who is learning to read, but for the child at a younger age who is learning about the world around him. How children perceive, what they do with the information that is present in their environments, how they distinguish things that adults do not notice, is not known for certain. Many have brought forth varied theories on how children perceive. Exactly how children perceive was not considered as a major point in this study.

This study was undertaken to determine if young children from ages three to five could learn through a series of specific instructional sessions, to discriminate visually on a specific task. The purpose was to determine if there were any differences in perceptive ability of boys and girls in this age range, and to see if younger children learned this task faster or more slowly than older children.

The children for this study were chosen at random from the Child Development Laboratories at Utah State University. The age differences that may have existed were not so great as they could have been had the experimenter selected strictly for age difference.

Twenty-three children were given a pre-test, of which three were found to be able to perform perfectly on this test. These three children were eliminated from the study. The 20 children remaining were used in this study and were divided into two groups. One group was an experimental group, the other was the control group. After the pre-test was given to both groups, the experimenter worked through the Teaching Resource instructional material on fruits and animals, with the experimental group. When the period of instruction was completed, both groups of children were given the post-test. The post-test was exactly the same as the pre-test, and was administered approximately two weeks following the pre-test.

Ten of the 20 children used in the study were selected to be used in the experimental group. Each of these children were asked on two specific occasions to leave the laboratory with the experimenter. This was a short session during which the children were taken through a specific instructional sequence as outlined by Cheves (1968) who wrote the Teaching Resource Materials used in this study.

Three hypotheses were tested in the study:

The first hypothesis, that a sequence of experiences in visual perception will contribute to children's ability to transfer their learned skills to more abstract representations of the same objects was supported. Children who received training, in the experimental group, made significantly greater gains in perception ability than was true of the control group.

The second hypothesis, that there will be no significant difference between boys and girls in their response to training in visual perception, was also supported. The differences between boys and girls, in their responses to the training experience were not significant, although the girls did tend to make somewhat greater advances than did the boys.

The third hypothesis, that there will be no significant difference between three and four year old children in their response to visual perception, was also supported. There were no significant differences between older and younger children in their demonstrated abilities to benefit from training in visual perception.

Conclusions

From this study it may be concluded that children of pre-school age may benefit from training in perception tasks and, that this benefit extends to their being able to transfer their perception skills from realistic to more abstract representations.

DISCUSSION

An important thing to remember when considering this study is the fact that children in both the experimental and control groups were participating in the rich learning environment of the Child Development Laboratory at the time the study was conducted. This fact would tend to minimize the benefits available to the children in the experimental group, as contrasted to those in the control group, because all children in both groups were receiving a variety of opportunities to learn and develop in several areas, including perception.

Children in both the experimental and control groups made progress from the pre-test to the post-test in this study. Two of the children in the control group made no progress from the pre-test to the post-test. One child in the control group had a lower test score on the post-test than she had on the pret-test. The experimenter was unable to determine the cause of this lowered score. There could have been a number of reasons for this. Illness may have been one reason. However, if the child was ill the experimenter was unable to detect this fact. The child did not seem bored with the task nor did she seem to be having trouble coping that day. There was no apparent reason for the lower score on the post-test.

There was one limitation to the study. The instrument used provided a ceiling of possible correct answers. There were 18 correct picture puzzle positions scored on the pre-test and post-test. Five of the nine children in the experimental group reached this ceiling of 18 possible points. There were no children in the control group to reach the ceiling. It is not possible to know from this study exactly how much growth could be achieved from this type of training, because of the limitations imposed by the instrument used in the study.

The child who increased the most was actually the youngest child in the study. The fact that she made the greatest increase without reaching the 18 point ceiling is of particular interest. She had the lowest score on the pre-test of any child in either group. Consequently, she had more potential for growth than any of the other children. The fact that she was the youngest demonstrates that children close to three years of age can learn specific visual perception tasks.

The average age of the children in the experimental group was three years eight months. The average age of the children in the control group was four years one month. Though there is not a significant difference in age, it is interesting to the researcher that the younger children were able to progress with the tasks of visual perception training, and the older children that did not have the training sessions did not progress as well as the younger children.

Suggestions for further study

1. Do children and adults actually see the same things? A study might be designed to determine whether or not children use the same visual cues to identify an object as do adults.

2. Another study in the same area could be designed to determine what cues the earlier readers use.

3. A study might be done to determine whether or not a child identifies a familiar object in a picture cluttered with many things more readily than a picture with a single, or simple, theme.

4. The use of photographs would be of interest to determine which a child recognizes more readily, a color photograph or one of black and white composition.

5. A study which would require some depth is the area of reading readiness, to determine what children notice first: An array of black marks, or shapes, letters, or a printed word on a background of white paper.

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APPENDIX

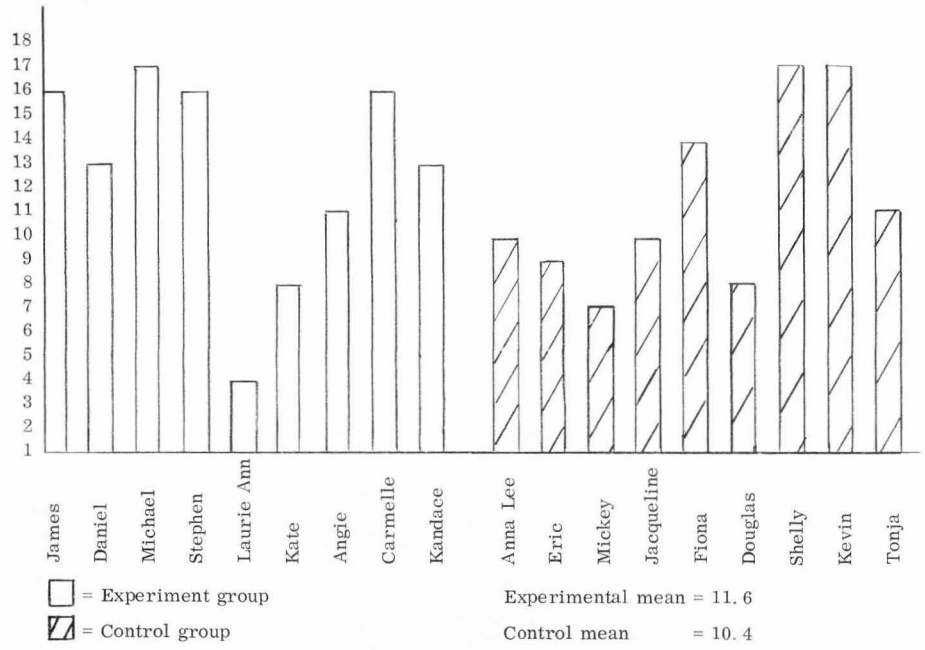
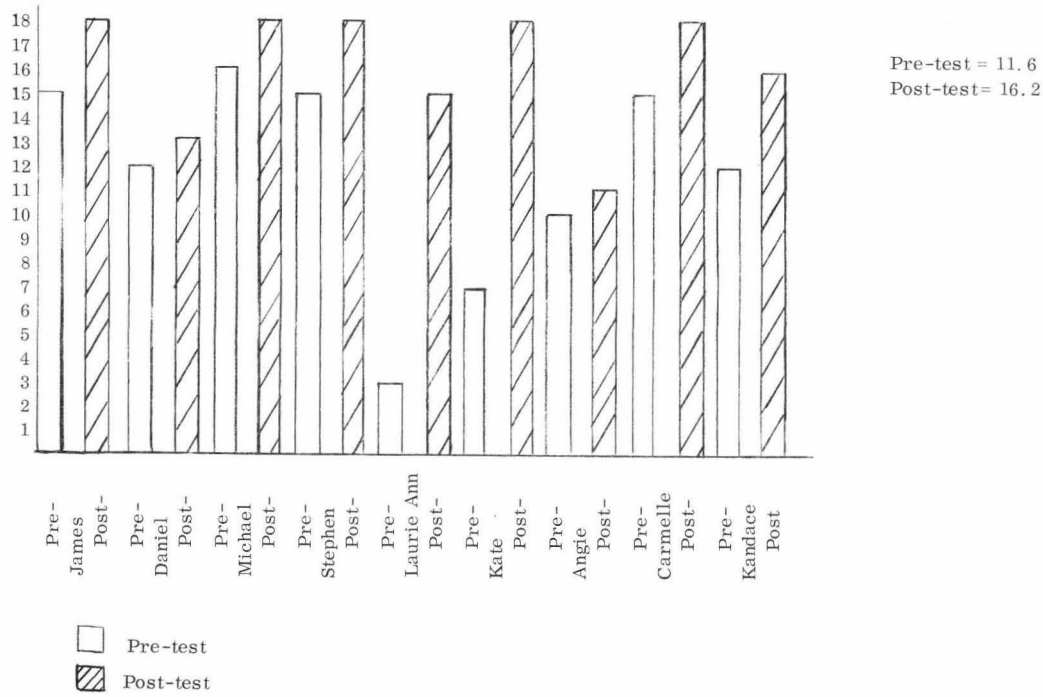


Figure 3. Pre-test scores for children in the experimental and control groups



Pre-test = 11.6
Post-test= 16.2

Figure 4. Pre-test and post-test for children in the experimental group.

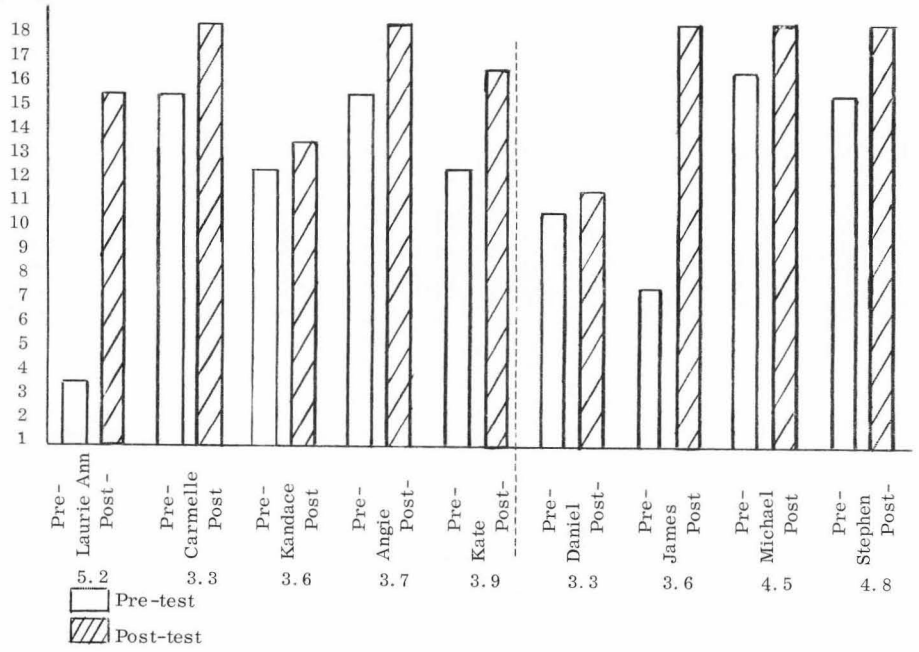


Figure 5. Pre-test and post-test scores for boys and girls in the experimental group

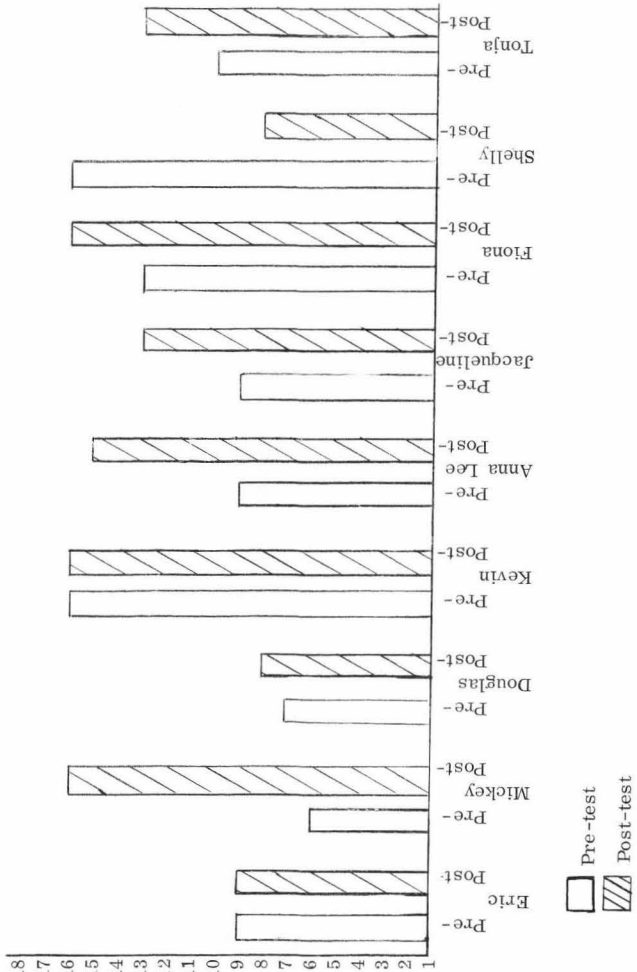


Figure 6. Pre-test and post-test scores of boys and girls in the control group

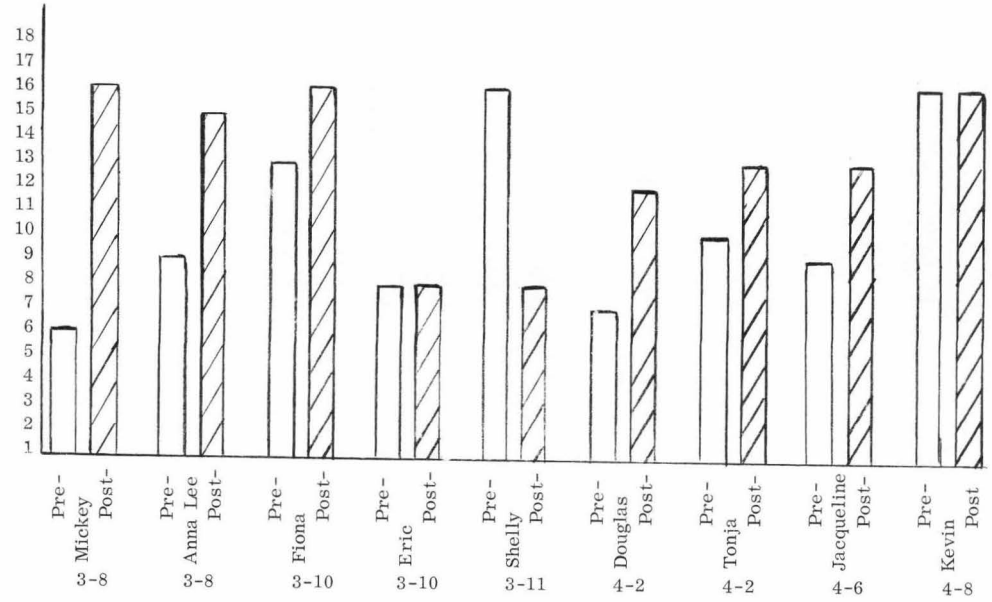


Figure 7. Pre-test and post-test scores for younger and older children in the control group

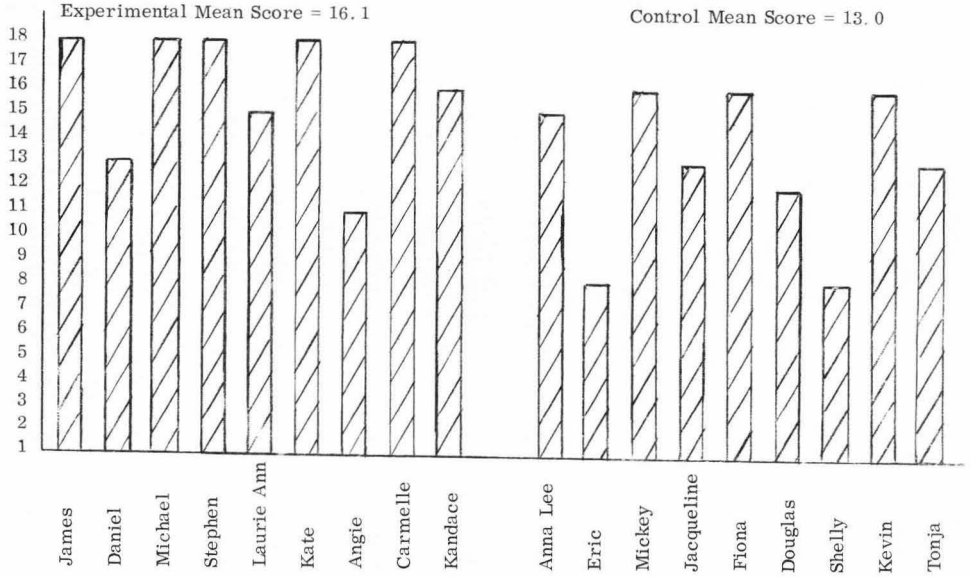


Figure 8. Post-test scores for children in experimental and control groups

VITA

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